

ABSTRACT OF THE INVENTION

The method of the invention in one aspect involves electronic power control by varying the amplitude of an electrical power supply voltage, independent of frequency, whereby the output frequency will always be the same as the input frequency. An electrical circuit apparatus for accomplishing this function in a preferred embodiment is also disclosed herein. The preferred circuitry of this aspect of the invention uses four solid state switches, such as IGBT's, four diodes, an inductor, input and output filters and novel controlling circuitry. The controller apparatus and methods of the invention may be used to implement all otherwise conventional converter types, buck, boost, and inverting (and duals of these) versions to obtain different regulating characteristics, including galvanic isolation of the output from the input. The inventive methods and devices may be used in power factor correction, voltage and/or current harmonic filtering and neutralization, line and load conditioning, control of power transfer between two power grids, and programmable control of surges, sags, dropouts and most other voltage regulation problems.